



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/666,795	09/18/2003	Steven Francis Best	AUS920030447US1	9023

28722 7590 03/27/2006

BRACEWELL & PATTERSON, L.L.P.  
P.O. BOX 969  
AUSTIN, TX 78767-0969

EXAMINER

NGUYEN, TANH Q

ART UNIT	PAPER NUMBER
----------	--------------

2182

DATE MAILED: 03/27/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/666,795

Applicant(s)

BEST ET AL.

Examiner

Tanh Q. Nguyen

Art Unit

2182

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 September 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 03/29/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

**DETAILED ACTION**

***Claim Objections***

1. Claims 5, 8, 10, 14, 16, 17, 18, 20, 21, 23, 25 are objected to because of the following informalities:

“said I/O” in line 3 of claim 5 should be replaced with “said I/O operation”

“said storage space” in line 2 of claim 8 should be replaced with “said additional storage space”

“said I/O” in line 2 of claim 10 should be replaced with “said I/O operation”

“said I/O” in line 3 of claim 14 should be replaced with “said I/O operation”

“said storage space” in line 2 of claim 16 should be replaced with “said additional storage space”

“said I/O” in line 2 of claim 17 should be replaced with “said I/O operation”

“said dynamically expanding step” in line 1 of claim 17 should be replaced with “said dynamically expanding means”

“FR” in line 4 of claim 18 should be replaced with “failure response (FR)”

“activation..” in line 6 of claim 20 should be replaced with “activation.”

“LVM” in line 3 should be replaced with “logical volume manager (LVM)”

“said I/O” in line 6 of claim 21 should be replaced with “said I/O operation”

“said storage space” in line 3 of claim 23 should be replaced with “said additional storage space”

“The computer program product of claim 16” in line 1 of claim 25 should be replaced with “The computer program product of claim 19” - as claim 16 is a system

Art Unit: 2182

claim and claim 25 appears to recite limitations associated with a computer program product

"said I/O" in line 3 of claim 25 should be replaced with "said I/O operation".

***Claim Rejections - 35 USC § 112***

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

3. Claims 6-9, 15, 16, 18, 20, 21, 22, 23, 24 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 6 recites the limitation "the kernel space" in lines 2-3

Claim 7 recites the limitation "said I/O command" and "said storage space" in line

2

Claim 8 recites the limitation "said reserve space" in line 2

Claim 9 recites the limitation "said preset amount of space" in line 2

Claim 15 recites the limitation "the kernel space" and "the LVM" in line 2

Claim 16 recites the limitation "said reserve space" in line 2

Claim 18 recites the limitation "said LVM" in line 3

Claim 20 recites the limitation "said volume group" in line 2

Claim 21 recites the limitation "the kernel space" and "the LVM" in line 3

Claim 22 recites the limitation "said I/O command" in line 5

Claim 23 recites the limitation "said reserve space" in line 3

Claim 24 recites the limitation "said reserve space" in line 2

There are insufficient antecedent bases for the limitations in the respective claims. Furthermore, claim 18 recites the limitation "I/O CC and OS functional logic" in line 2. It is not clear what I/O CC represents.

The rejections that follow are based on the examiner's best interpretation of the claims.

***Claim Rejections - 35 USC § 101***

4. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 19-24/25 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

Claim 19 recites "a computer readable medium" on line 2. Since applicant intends for the "computer readable medium" to encompass transmission type media such as ...communication links [[0054], lines 6-9], "computer readable medium" is not considered a manufacture. It is recommended that the claims be amended to exclude transmission type media from "computer readable medium". Claims 20-24 are rejected because they depend on claim 19. Furthermore, since it appears that claim 25 should depend on claim 19 rather than claim 16, claim 25 is also rejected.

***Claim Rejections - 35 USC § 102***

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

Art Unit: 2182

form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. Claims 1-8, 11-15, 18, 19-22, 24 are rejected under 35 U.S.C. 102(e) as being anticipated by Kano et al. (US 6,725,328).

8. As per claim 1, Kano teaches in a computer system having I/O components and a file system [col. 3, lines 22-25] existing within a volume group comprised of storage media [FIG. 1], a method for substantially preventing I/O failure due to insufficient storage space within the file system, said method comprising:

determining that a received I/O operation directed at said file system requires more storage space than is currently available within said file system [NO from step 6003, FIG. 6];

dynamically expanding the storage space available within said file system to accommodate said I/O operation, wherein additional space on said volume group is allocated to said file system [step 6004, FIG. 6]; and

subsequently completing said I/O operation within said file system [step 6005, FIG. 6];

wherein said dynamically expanding step and said subsequently completing step are both completed without user input and/or activation [col. 2, lines 15-19; col. 10, lines 44-46].

9. As per claims 2-8, Kano teaches said dynamically expanding step includes assigning reserve storage space existing within said volume group to a logical volume hosting said file system [step 8001, FIG. 8; col. 6, lines 34-39];

said subsequently completing step comprises restarting said I/O operation within kernel space (after expansion) without requiring user input [step 6005, FIG. 6];

issuing a notification indicating that said dynamically expanding step is being completed [steps 6004-6005 of FIG. 6 show I/O processor part being notified of dynamic expansion; col. 1, lines 34-37];

signaling a logical volume manager (LVM) of a need for additional storage space for completing said I/O operation [I/O detector part issuing a capacity increase command - step 7001, FIG. 7]; completing an automatic expansion of a logical volume hosting said file system, wherein said dynamically expanding step expands said file system into available space within said logical volume following said automatic expansion [step 8001, FIG. 8; col. 6, lines 34-39];

said signaling step is completed via an I/O failure response (FR) daemon [1231 - FIG. 1] that coordinates communication between control blocks in a kernel space [1130, 1131, 1132 - FIG. 1] and the LVM [1131, 1232, 1233, 1235 - FIG. 1].

said determining step comprises parsing parameters from said I/O operation for a storage space size required to complete said I/O operation [step 6002, FIG. 6]; and comparing said storage space with an available storage space size within said file system [step 6003, FIG. 6];

said dynamically expanding step comprises determining that said additional

Art Unit: 2182

storage space is available within a reserve space [step 8001, FIG. 8; col. 6, lines 34-39] and expanding said file system to include a preset amount of space (a segment) from said reserve space.

10. As per claims 11-15, the claims are system claims that generally correspond to method claims 1-6 above and are rejected on the same basis.

11. As per claim 18, Kano further teaches an I/O controller [1230, FIG. 1; col. 5, lines 48-52] and OS functional logic [col. 3, lines 29-33] being used in determining whether more storage space is needed, the LVM [1131, 1232, 1233, 1235 - FIG. 1] including a capacity controller part, and the I/O failure response (FR) daemon [1231, FIG. 1] bridging a communication between the I/O controller [1230, FIG. 1] at an OS level [1131, 1132 - FIG. 1] and the LVM [1131, 1232, 1233, 1235 - FIG. 1] at an application level [1110, FIG. 1].

12. As per claims 19-22, claims 19-20, 22 are claims for a computer program product that generally correspond to method claims 1-3, 7 above and are rejected on the same basis. As per claim 21, see the rejections of claims 1, 4-6.

13. As per claim 24, Kano teaches signaling a complete failure of said I/O operation when there is not sufficient space within said reserve space [step 8006, FIG. 8; 10005, FIG. 10].

### ***Claim Rejections - 35 USC § 103***

14. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:



Art Unit: 2182

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

15. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

16. Claims 9-10, 16-17, 23, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kano et al..

17. As per claims 9, 16, 23, Kano discloses the invention except for said expanding step includes iteratively expanding said file system by a preset amount of space until a total space within said file system is sufficient to accommodate said I/O operation.

Since it was known in the art at the time the invention was made to iteratively expand a storage space in a system by a preset amount of space until enough space is available to process an operation, it would have been obvious to one of ordinary skill in the art at the time the invention was made for the dynamic expansion in Kano to iteratively expand the file system by a preset amount until enough space is available for the I/O operation - in order to provide sufficient space within said file system to process

said I/O operation. It is further noted that the iterative expansions would obviate the need to calculate the size required for the expansion.

Furthermore, since applicant discloses two embodiments [[0013], pages 4-5], one involving iterative expansions with fixed size increments, and the other involving a single expansion with a calculated size to accommodate the I/O operation, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the embodiment with iterative expansions is no more than an obvious variant of the embodiment with a single expansion.

18. As per claims 10, 17, 25, Kano discloses the invention except for said dynamically expanding step comprises calculating an amount of additional space required to complete said I/O operation, with consideration of currently available space within said file system and dynamically expanding said file system by at least said amount of additional space required.

Since it was known in the art at the time the invention was made to expand a storage space in a system by a calculated amount of additional space required to complete an operation - in order to provide sufficient space in a single expansion, it would have been obvious to one of ordinary skill in the art at the time the invention was made to calculate an additional amount of space in order to expand the file system with a single expansion to provide space to complete the I/O operation.

Furthermore, since applicant discloses two embodiments [[0013], pages 4-5], one involving iterative expansions with fixed size increments, and the other involving a single expansion with a calculated size to accommodate the I/O operation, it would have

Art Unit: 2182

been obvious to one of ordinary skill in the art at the time the invention was made that the embodiment with a single expansion is no more than an obvious variant of the embodiment with iterative expansions.

### ***Double Patenting***

19. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

20. Claims 1, 7, 11, 19, 22 are provisionally rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1, 3, 9, 11, 16, 18 of copending Application No. 10/697,899. Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1, 3, 9, 11, 16, 18 of the copending application claim:

determining that a received I/O operation directed to a file system requires more

Art Unit: 2182

space than is currently available [claim 1, lines 1-4; claim 3, line 2; claim 9, lines 1-4; claim 11, lines 4-5; claim 16, lines 1-5; claim 18, lines 3-4];

dynamically expanding the storage space available to accommodate the I/O operation, wherein additional space is allocated to the file system and subsequently completing the I/O operation [claim 3, lines 2-4; claim 11, lines 5-6; claim 18, lines 4-5].

wherein the dynamically expanding step and the subsequently completing step are completed without user input and/or activation [steps are performed for storing data in a file system, and also because the disclosure does not suggest the steps being performed with user input and/or activation].

Furthermore, since it was known in the art at the time the invention was made to parse parameters from a command for storing data to obtain a size of storage required to complete the command, and comparing the obtained storage size with the available storage size of the file system, it would have been obvious to one of ordinary skill in the art at the time the invention was made to do so in order to determine whether additional space is needed.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thanh Quang Nguyen whose telephone number is (571) 272-4154 and whose e-mail address is [tanh.nguyen36@uspto.gov](mailto:tanh.nguyen36@uspto.gov). The examiner can normally be reached on Monday-Friday from 8:30 AM to 5:00 PM.

Art Unit: 2182

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kim Huynh, can be reached on (571) 272-4147. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300 for After Final, Official, and Customer Services, or (571) 273-4154 for Draft to the Examiner (please label "PROPOSED" or "DRAFT").

Effective May 1, 2003 are new mailing address is:

Mail Stop \_\_\_\_\_

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

Effective December 1, 2003, hand-carried patent application related incoming correspondences would be to a centralized location.

U.S. Patent and Trademark Office

2011 South Clark Place

Customer Window


Crystal Plaza Two, Lobby, Room 1B03

Arlington, VA 22202

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197.

TQN

March 12, 2006



03/12/2006